MOUNTING EQUIPMENT FOR MOUNTING A DISPENSER MEMBER ON A RECEPTACLE NECK

The present invention relates to mounting equipment for mounting a dispenser member on a receptacle neck. This kind of mounting equipment is often used in various technical fields such as the fields of perfumery, cosmetics, or even pharmacy, and serves to mount any kind of pump, valve, or dispenser head on a receptacle provided with a neck. The purpose of the dispenser member is to dispense the fluid contained inside the receptacle. The dispenser member is often engaged in or on the neck so as to be able to withdraw, or be fed with fluid from the receptacle. The neck of the receptacle generally presents an axis of symmetry. The axis of symmetry usually coincides with the axis of the receptacle.

A plurality of mounting techniques exist using such mounting equipment. For example, mounting equipment exists that is adapted to mount the dispenser member by screwing a ring around the receptacle neck. Crimping equipment also exists. Other mounting equipment also exists enabling a plurality of component elements of a fastener member to be moved down successively onto the neck. A conventional design for a fastener member consists in providing a fastener ring associated with a covering hoop. The fastener ring can become engaged on the outside of the receptacle neck in relatively simple manner, and without exerting much pressure, and then the covering hoop is moved down by the mounting equipment so as to block the ring around the neck. Another and simpler mounting technique exists, consisting in force-fitting the dispenser member on or in the receptacle neck. Naturally, the dispenser member is also, or can also be provided with an integrated or an associated fastener member which becomes engaged with the receptacle neck, and which thus fastens the dispenser member on the neck after being force-fitted. In this mounting

technique, the dispenser member, together with its associated or incorporated fastener means, is made as a single piece which does not change between its initial state before mounting and its final state after mounting. In other words, the purpose of the mounting equipment is not to move one piece of the dispenser member relative to another piece, as is the case with the above-mentioned fastener-ring and covering-hoop system. Consequently, the mounting equipment includes a thrust member that is capable of exerting thrust on the dispenser member so as to force-fit it on the receptacle neck. The thrust member is preferably a single member that bears on a thrust zone of the dispenser member, said thrust zone being static relative to the remainder of the dispenser member. In other words, said thrust zone does not move relative to the dispenser member as a whole, while said dispenser member is being force-fitted on the receptacle neck. The present invention relates more specifically to this type of mounting equipment enabling a dispenser member that is made as a single piece to be force-fitted on a receptacle neck, but without that excluding the ring and hoop system.

In this context, the dispenser member, together with the fastener means, is mounted on a receptacle neck in the following way: firstly the dispenser member is brought up to and then placed on the receptacle neck. Naturally, placing the dispenser member on the receptacle neck does not guarantee that it is in alignment on the axis of symmetry of the receptacle neck. It therefore often occurs that the dispenser member is placed in a manner that is completely offset or inclined relative to the axis of symmetry of the receptacle neck. Thus, it will be easily understood that it is not possible to exert thrust on a dispenser member in order to force-fit it on the receptacle neck, while the dispenser member is itself offset. Thrust on such an offset dispenser member would merely have the effect of offsetting it even more,

and then of destroying it by flattening it on the receptacle neck.

An object of the present invention is therefore to remedy the drawback connected with the dispenser member being offset during its initial placement on the receptacle neck, before exerting the force-fitting thrust in order to secure it on the receptacle neck. Although such a disadvantage often occurs with force-fitting dispenser members, that drawback can also occur with other kinds of dispenser member, such as the above-described dispenser member which implements a fastener ring and a covering hoop, for example.

To achieve this object, the present invention provides mounting equipment that further includes a first guide wall for bringing the dispenser member at least approximately onto the axis of the neck, and a second guide wall for bringing the dispenser member more accurately onto the axis of the neck. By providing these two successive guide walls, the dispenser member can be stood up from extreme offset positions. The first guide wall enables it to be stood up approximately, whereas the second guide wall enables the axis of the dispenser member to be brought practically to coincide with the axis of the neck. The second guide wall may advantageously be formed by the thrust member.

In a practical embodiment, the first guide wall is frustoconical, at least in part, and converges towards the second guide wall. The two guide walls thus form a kind of funnel, inside which the offset dispenser member can be brought into a position that is substantially in alignment on the axis of the receptacle neck.

According to another advantageous characteristic of the invention, the second guide wall is displaceable relative to the first guide wall between a rest position and a thrust position. A third guide wall can advantageously be provided to perfect the alignment of the dispenser member on the axis of the neck. In this

case, the second guide wall may be displaceable relative to the third guide wall between a rest position and a thrust position, the third guide wall being masked in the rest position, and unmasked in the thrust position. In an advantageous embodiment, the thrust member progressively unmasks the third guide wall, while moving from its rest position to its thrust position. The first guide wall and the third guide wall may also be secured to each other and static relative to each other. In this case, the first guide wall may be frustoconical, at least in part, and may be extended by a substantially cylindrical portion forming the third guide wall.

According to another characteristic of the invention, the thrust member may be urged towards its rest position by resilient return means.

In a practical embodiment, the thrust member forms a bushing including an inside wall that is cylindrical, at least in part, and a free bottom end, the inside wall forming the second guide wall, and the free bottom end forming a contact zone adapted to come into thrust contact with the dispenser member. In the rest position, the bushing preferably masks the third guide wall.

The invention therefore proposes implementing a plurality of successive guide walls making it possible to bring the dispenser member progressively more accurately into alignment on the axis of the neck. The fact of displacing the second guide wall relative to the first so as to unmask the third guide wall is particularly advantageous, since the dispenser member can be oriented or aligned even more by using the third guide wall, while the dispenser member is engaged with the second guide wall. The second and third guide walls can therefore be used simultaneously. This is possible because the second guide wall is displaced relative to the first, and especially relative to the third.

The invention is described more fully below with reference to the accompanying drawings which show an

embodiment of the invention by way of non-limiting example.

In the figures:

· Figure 1 is a vertical section view through mounting equipment of the invention in its rest position;

· Figure 2 is a view similar to the view in Figure 1 of mounting equipment in the thrust position;

· Figure 3 shows the mounting equipment of Figures 1 and 2 associated with a fluid dispenser during various successive mounting steps;

· Figure 4 is a large-scale view of a detail A in Figure 3; and

· Figure 5 is a large-scale view of a detail B in Figure 3.

Reference is made firstly to Figures 1 and 2 in order to describe mounting equipment constituting an embodiment of the invention. The mounting equipment comprises a cap or mandrel 11 designed to come into engagement with a press or any other means enabling pressure to be generated along a predetermined axis. The mandrel 11 therefore has a top portion 110 designed to be held by retention means associated with the press, and a bottom portion forming a ring 111 having an inside wall that forms a housing 113 for a return spring 13. The ring 111 also forms a bottom annular end 114 serving as an abutment surface as described below. The ring 111 also defines an outside wall 112 that is engaged in a sleeve 12 which forms a piece that is secured to the mandrel 11 by any technical means (force-fitting, welding, adhesion, screw-fastening, clamping, etc.). To this end, the sleeve 12 forms a connection section 121 that is engaged on the mandrel 11. Beyond the connection section 121, the sleeve 12 forms a cylinder 123 that inwardly-defines a slideway 124. At its bottom end, the cylinder 123 is connected to a head 125 which defines a shoulder 126 which extends radially inwards from the slideway 124. From the inside periphery of the shoulder

126, the head 125 defines a substantially cylindrical wall 127. In the extension of the wall 127, the head defines a frustoconical guide wall 128 that flares outwards from the wall 127. The frustoconical guide wall 128 can be terminated by an annular wall 129 which defines the bottom end of the sleeve 12 and of the mounting equipment as a whole.

The sleeve 12 thus forms an inner housing defined by the slideway 124, and having an opening that is narrower level with the wall 127 because of the inwardly-directed shoulder 126. At its top end, the inner housing is closed by the bottom portion of the mandrel 11 which defines the ring 111 and the housing 113 in which the top end of the return spring 13 is received. The housing formed by the sleeve 12 and by the mandrel 11 consequently contains the spring 13, but also contains a thrust member 14, which, in this case, is presented in the form of a slider mounted inside the sleeve 12. The thrust member 14 also defines a housing 143 in which the bottom end of the return spring 13 is received. Thus, the thrust member 14 is urged resiliently away from the mandrel 11. The thrust member defines a substantially cylindrical outside wall 142 adapted to come into substantially-frictionless sliding contact with the slideway 124 defined by the sleeve 12. In order to limit the displacement of the thrust member 14 in the sleeve 12, the thrust member 14 forms an inwardly-directed shoulder 146 adapted to come into abutment contact against the shoulder 126 formed by the head 125 of the sleeve 12. This can be seen in Figure 1, which shows the thrust equipment in its rest position, i.e. with the return spring 13 urging the thrust member 14 away from the mandrel 11. However, if pressure is exerted on the thrust member 14 so as to displace it towards the mandrel 11, it can reach a final actuated position, as shown in Figure 2. In this position, the thrust member 14 comes into contact with the abutment surface 114 of the mandrel

11 via a corresponding bearing surface 141 formed around the housing 143. This can be seen clearly in Figure 2. The return spring 13 is thus maximally compressed. In addition, the shoulder 146 of the thrust member 14 is no longer in contact with the shoulder 126 of the head 125 of the sleeve 12. The thrust member 14 is thus displaceable in translation inside the sleeve 12 between its rest position (Figure 1) and its thrust or actuated position (Figure 2).

In the invention, the thrust member 14 also includes a bushing 147 disposed at the bottom end of the thrust member. The bushing 147 extends downwards to define a bottom end 149. The bushing 147 extends from the inside periphery of the shoulder 146. The bushing 147 forms an inside wall 148 and an outside wall 144 which is adapted to slide with or without friction relative to the wall 127 of the sleeve 12. In the rest position shown in Figure 1, the bushing 147 masks the wall 127 of the sleeve 12, whereas in the thrust position shown in Figure 2, the bushing 147 unmasks the wall 127 of the sleeve 12 almost completely. A reception housing 140 is defined inside the bushing 147 and is designed to receive a portion of the dispenser member as described below.

It should thus be observed that the frustoconical guide wall 128 is constrained to move with the substantially cylindrical wall 127 which indeed extends from the smallest section of the frustoconical wall. In addition, the inside wall 148 defined by the bushing 147 of the thrust member 14 is displaceable relative to the two walls 127 and 128 because the thrust member 14 is displaceable in translation inside the sleeve 12.

In the invention, the frustoconical guide wall 128 defines a first guide wall, the inside wall 148 of the bushing 147 forms a second guide wall, and the substantially cylindrical wall 127 forms a third guide wall. The first guide wall enables the dispenser member to be aligned approximately, the second guide wall

enables the alignment of the dispenser member to be improved, and the third guide wall enables its alignment to be perfected, so as to bring it into an alignment that is suitable for force-fitting it on a receptacle neck. However, in some cases, the third guide wall can be omitted from the invention.

Reference is made below to Figure 3 in order to explain how the mounting equipment operates when force-fitting a dispenser member on a receptacle neck. Figure 3 shows five views illustrating five successive steps of the mounting process using the mounting equipment of the invention. The leftmost view shows a receptacle 2 presenting a body 21 held in a support 4. The receptacle 2 also forms a neck 22 which defines an opening making it possible to access the inside of the body 21. Naturally, the body 21 is adapted to contain a fluid. The neck 22 presents an axis of symmetry X, which, in this case, coincides with the axis of symmetry of the body 21. It is also possible to envisage receptacles in which the axis of symmetry of the neck 22 does not coincide with the axis of symmetry of the body 21. A dispenser member 3, whose only visible portions are constituted by a fastener ring 32 and by a pushbutton 31, is disposed on the neck 22. The function of the fastener ring 32 is to co-operate with the outside portion of the neck 22 so as to fasten the dispenser member on the neck. The function of the pushbutton 31 is to enable the dispenser member to be actuated by pressing thereon. The pushbutton 31 is displaceable in translation inside the ring 32. In this case, the term "ring" refers to any fastener means adapted to be put in place on a neck by being force-fitted on a neck. It could very well be that the fastener ring 32 includes an external cover provided for appearance purposes. The leftmost view in Figure 3 clearly shows that the dispenser member 3 is in a tilted or inclined position on the neck 22 as a result of the dispenser member being

placed randomly on the neck 22. In this case, the dispenser member 3 presents an axis of symmetry Y which forms an angle Z with the axis of symmetry X of the neck 22. The mounting equipment 1 has not yet been actuated.

In the second view situated to the right of the above-mentioned leftmost view, the pushbutton 31 of the dispenser member 3 has already come into contact with the first guide wall 128 which forms a converging cone. In reality, the pushbutton 31 comes into contact with the converging wall 128 via its top annular edge. In this view, it can also be seen that the dispenser member 3 has already been stood up to some extent, since its axis of symmetry Y is already closer to the axis of symmetry X of the neck 22. In order to bring the dispenser member into contact with the converging wall 128, it is necessary either to raise the receptacle 2, or preferably to lower the mounting equipment by exerting thrust, symbolized by the arrow situated at the top end of the mounting equipment. Thus, as the mounting equipment is lowered, the pushbutton 31 slides over the converging wall 128 which is preferably made with a particularly smooth surface state. This has the effect of progressively but approximately standing up the dispenser member 3, so as to bring its axis of symmetry Y towards the axis of symmetry X of the neck 22. By continuing to lower the mounting equipment, the pushbutton 31 finally leaves the converging wall 128 and becomes engaged in the reception housing 140 formed by the thrust member 14. As the pushbutton 31 becomes engaged in the housing 140, it is guided by the second guide wall 148 formed by the inside wall of the bushing 147 of the thrust member 14. Guidance of the pushbutton 31 is improved as it penetrates into the housing 140.

The pushbutton 31 penetrates into the housing 140 until the bottom end 149 of the bushing 147 comes into contact with the top end of the ring 132. The end 149 thus forms a zone of contact with the dispenser member,

which zone of contact is adapted to transfer the thrust force generated by the mounting equipment. It can also be clearly seen that the top end of the pushbutton 31 does not come into contact with the end wall of the housing 140. Thus, no thrust is exerted on the pushbutton 31. This position is shown in the middle view in Figure 3. It can almost be said that the dispenser member is now in perfect alignment on the axis of the neck 22. In some cases, the position of the dispenser member is suitable for enabling force-fitting to take place without difficulty. In this case, it is not necessary for the thrust member 14 to be displaceable relative to the sleeve 12. The mounting equipment thus includes only two guide walls, namely the converging wall 128, and the substantially cylindrical wall 148.

However, in some cases, it is necessary to improve still further the alignment of the dispenser member relative to the axis of the neck, so as to ensure the success rate of force-fitting is close to 100%. In this case, it is preferable for the thrust member 14 to be displaceable relative to the sleeve 12, as described above with reference to Figures 1 and 2.

Reference is made below to the fourth view in Figure 3, situated to the right of the above-mentioned middle view. By continuing to exert thrust on the mounting equipment, the thrust member 14 which is in bearing contact against the ring 32 of the dispenser member begins to be displaced inside the sleeve 12 against the action of the spring 13. As the thrust member 14 is displaced, the bushing 147 unmasks the third guide wall 127. The outside wall of the ring 32 thus comes to slide with or without friction over the third guide wall 127, thereby making it possible to bring the axis of the dispenser member into perfect alignment on the axis of the neck 22. A 100% success rate is thus ensured for force-fitting dispenser members perfectly on necks. It should be observed that, at this stage of

assembly, the dispenser member is not yet force-fitted on the neck.

This takes place only when the thrust member 14 comes into abutment against the mandrel 11, as shown in the rightmost last view in Figure 3. The spring is thus maximally compressed. The thrust force exerted on the mandrel 11 is then transmitted in full to the thrust member 14, which, in turn, transmits it to the ring 32, thereby lowering the ring 32, and consequently the entire dispenser member onto the neck 22 by force.

The displacement of the thrust member 14 causes the fastener ring 32 to be engaged inside the third guide wall 127, whereas the pushbutton 31 is engaged in the second guide wall 148. Thus, the prepositioning of the dispenser member resulting from its pushbutton being prepositioned in the second guide wall 148 serves to perfect its alignment by engaging the outside wall of the fastener ring 32 in the third guide wall 127.

Reference is made below to Figures 4 and 5 which are large-scale views of details of Figure 3 which make it possible to understand how the third guide wall can perfect the alignment of the dispenser member.

It can be seen clearly in Figure 4 that the outside wall 311 of the advantageously-cylindrical pushbutton 31 is not in contact with the wall 148 forming the second guide wall of the mounting equipment of the invention. On the contrary, a small gap U exists that prevents the pushbutton 31 from becoming jammed in the second guide wall 148. It should not be forgotten that, before penetrating into the second guide wall 148, the pushbutton 31 is not in perfect alignment on the axis, since it has just come from the first guide wall 128 which stands it up only approximately.

With reference to Figure 5, it can be seen that the fastener ring 32, which defines an advantageously-cylindrical outside wall 321, comes almost into contact with the third guide wall 127: in practice, a small gap W

exists which is much smaller than the gap U which exists between the pushbutton and the guide wall. The small gap W enables the dispenser member to be aligned accurately on the axis of the neck. Reliable force-fitting is thus guaranteed. This accurate alignment, resulting from the engagement of the ring 32 in the third guide wall, is made easy as a result of the pushbutton 31 being previously engaged in the second guide wall, and especially as a result of the pushbutton also being engaged in the second guide wall when the fastener ring 32 penetrates into the third guide wall.

The spirit of the invention resides in using mounting equipment which makes it possible to stand up and align the dispenser member progressively during distinct steps until it is accurately aligned, thus guaranteeing reliable force-fitting.